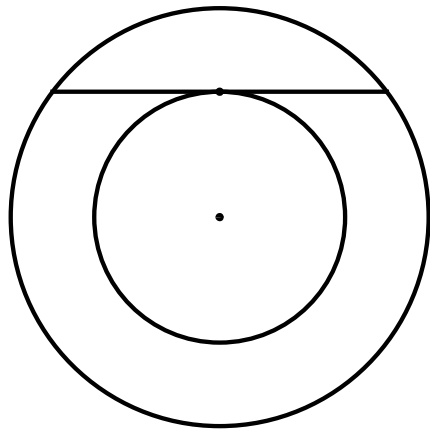


Worksheet 8.2: Tangents

1. A point is 13 cm. from the center of a circle whose radius is 5 cm. Find the length of the tangent segment from this point to the circle.

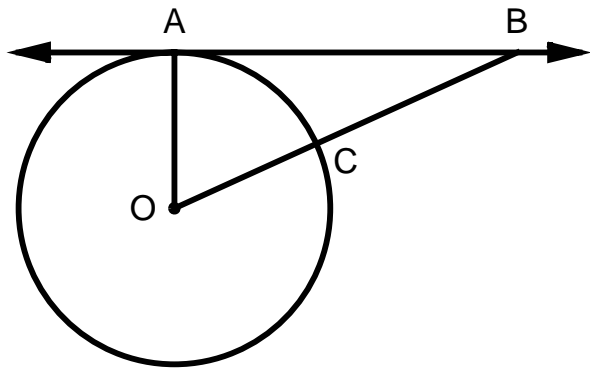
2. In the figure below the two concentric circles have radii of 3 and 5, respectively. Find the length of a chord of the *larger* circle which is tangent to the smaller circle.



3. In $\odot O$, radius $\overline{OA} \perp \overline{OB}$. If $OA = 3$, find AB .

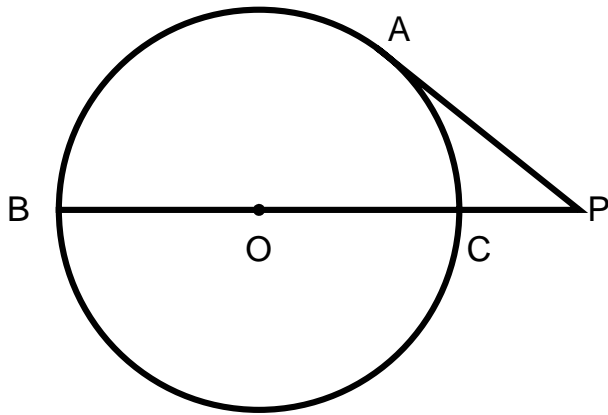
4. In $\odot O$, \overline{OA} and \overline{OB} are radii and $m\angle AOB = 60^\circ$. If $AB = 12$, find OA .

5. In the figure below, \overleftrightarrow{BA} is tangent to $\odot O$ at A . Radii \overline{OA} and \overline{OC} are drawn, and \overline{OC} is extended to intersect \overleftrightarrow{BA} at B .



If $BA = 15$ and $OB = 17$, find the measure of a radius of $\odot O$.

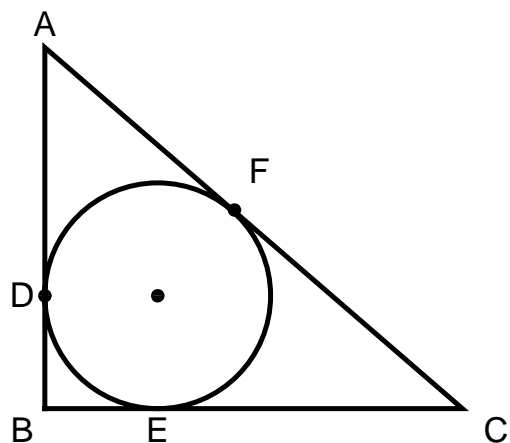
Questions 6 and 7 refer to the figure below. Diameter \overline{BC} is extended to point P and tangent \overline{PA} is drawn.



6. If $OC = 6$ and $CP = 4$, find AP .

7. If $OC = 12$ and $AP = 9$, find PC .

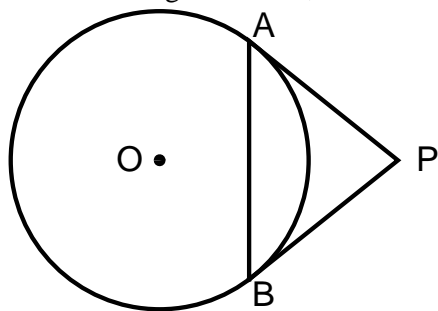
8.



If $AD = 9$, $DB = 5$, find AC .

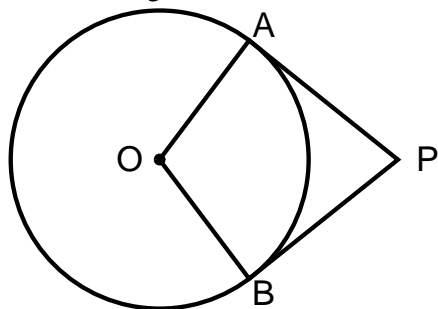
9. Two tangents to a circle form an angle of 60° . If the radius of the circle is 3, how long are the tangent segments in simplest radical form?

10. In the diagram below, \overline{PA} and \overline{PB} are tangents to $\odot O$ from P and chord \overline{AB} is drawn.



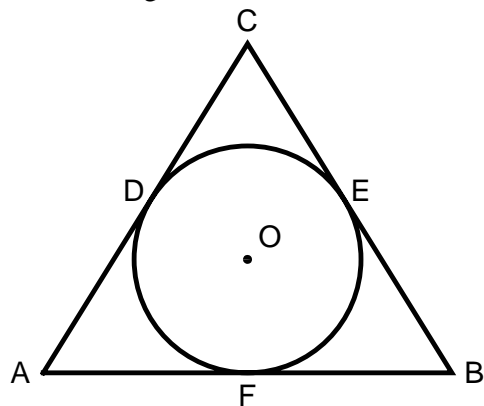
If $PA = 9x - 9$ and $PB = 3x + 33$, find x .

11. In the figure below, \overline{PA} and \overline{PB} are tangents to $\odot O$.



If $PA = 10$ and $OA = 5$, find the perimeter of quadrilateral $PAOB$.

12. In the figure below, $\odot O$ is inscribed in $\triangle ABC$ so that the circle is tangent to \overline{AB} at F , to \overline{BC} at E , and to \overline{AC} at D .



If $AF = FB = 5$ and $DC = 7$, find the perimeter of $\triangle ABC$.